

# Video Generative Adversarial Networks: A Review

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## Abstract

With the increasing interest in the content creation field in multiple sectors such as media, education, and entertainment, there is an increased trend in the papers that use AI algorithms to generate content such as images, videos, audio, and text. Generative Adversarial Networks (GANs) is one of the promising models that synthesizes data samples that are similar to real data samples. While the variations of GANs models in general have been covered to some extent in several survey papers, to the best of our knowledge, this is the first paper that reviews the state-of-the-art video GANs models. This paper first categorizes GANs review papers into general GANs review papers, image GANs review papers, and special field GANs review papers such as anomaly detection, medical imaging, or cybersecurity. The paper then summarizes the main improvements in GANs that are not necessarily applied in the video domain in the first run but have been adopted in multiple video GANs variations. Then, a comprehensive review of video GANs models are provided under two main divisions based on existence of a condition. The conditional models are then further classified according to the provided condition into audio, text, video, and image. The paper concludes with the main challenges and limitations of the current video GANs models.